

## ABSTRACT

A photodetector circuit incorporates an avalanche photodiode (APD) 300 produced by epitaxy on a CMOS substrate 302 with implanted n-well 304 and p-well 306. The n-well  
5 304 has an implanted p+ guard ring 310 delimiting the APD 300. Within the guard ring 310 is an implanted n+ APD layer 312 upon which is deposited an epitaxial p+ APD layer 314, these layers forming the APD 300. The APD may be incorporated in an amplifier circuit 50 providing feedback to maintain constant bias voltage, and may include an SiGe absorption region to provide extended long wavelength response or lower avalanche  
10 voltage. Non-avalanche photodiodes may also be used.